

# Claims

- [c1] 1. An apparatus for supplying recirculated exhaust gases to incoming air of a piston-type internal combustion engine, said apparatus comprising:  
a duct (2) for incoming air and a feed pipe (1) for exhaust gases and which opens out into an outlet section (3);  
said outlet section (3) comprising at least one outlet (4) for distributed supply of exhaust gases and said outlet section (3) constitutes an outlet path (a) that extends in the longitudinal direction of the duct (2) and the length of which is longer than an inner diameter of the feed pipe (1);  
said outlet path (a) has a length that is at least twice as long as the inner diameter of the feed pipe (1) whereby it is possible for an exhaust-gas pulse transported through the feed pipe (1) to be distributed into a portion ( $a_1$ ) of incoming air which, in the duct (2), passes the outlet section (3).
- [c2] 2. The apparatus as recited in claim 1, wherein the length of the outlet path (a) is at least three times as long as the inner diameter of the feed pipe (1)

- [c3] 3. The apparatus as recited in claim 1, wherein the length of the outlet path (a) is at least four times as long as the inner diameter of the feed pipe (1)
- [c4] 4. The apparatus as recited in claim 1, wherein the outlet section (3) comprises a plurality of outlets (4) that are distributed in a longitudinal direction of the duct and define the outlet path (a).
- [c5] 5. The apparatus as recited in claim 4, wherein the outlets (4) are distributed along a circumference running transversely to the motional direction of incoming air.
- [c6] 6. The apparatus as recited in claim 1, wherein the outlet section (3) comprises at least one elongated outlet (4) that extends in the longitudinal direction of the duct and defines the outlet path (a).
- [c7] 7. The apparatus as recited in claim 6, wherein a plurality of elongated outlets (4) are distributed along a circumference running transversely to the motional direction of incoming air in the form of substantially parallel slots in the longitudinal direction of the duct (2).
- [c8] 8. The apparatus as recited in claim 6, wherein at least one elongated outlet (4) extends along a circumference running transversely to the motional direction of incom-

ing air in the form of a helical slot.

[c9] 9. The apparatus as recited in claim 6, wherein at least one elongated outlet (4) extends along a circumference running transversely to the motional direction of incoming air in the form of a plurality of substantially parallel helical slots.

[c10] 10. The apparatus as recited in claim 1, wherein at least a part of the outlet section (3) is situated inside the duct (2) for incoming air.

[c11] 11. The apparatus as recited in claim 1, wherein at least a part of the outlet section (3) is situated outside the duct (2) for incoming air.

[c12] 12. The apparatus as recited in claim 1, wherein the effective outlet area of the outlet section (3) per unit of length increases in the direction of the main direction of flow of the exhaust gases in the outlet section (3).

[c13] 13. The apparatus as recited in claim 1, further comprising:  
at least one turbulator device.

[c14] 14. The apparatus as recited in claim 1, further comprising:  
at least one venturi device.

- [c15] 15. The apparatus as recited in claim 1, wherein the internal combustion engine is a diesel engine fitted to a heavy vehicle.
- [c16] 16. A process for supplying recirculated exhaust gases to incoming air to a piston-type internal combustion engine, which internal combustion engine comprises a duct (2) for incoming air and a feed pipe (1) for said exhaust gases, the supply of the exhaust gases to the duct (2) being distributed over an outlet path (a) which is extended in the longitudinal direction of the duct and the length of which is longer than the inner diameter of the feed pipe (1), the length of the outlet path (a) extended in the longitudinal direction of the duct is at least 20% of the path the incoming air will be displaced along in the duct (2) during the period between two successive exhaust-gas pulses from said internal combustion engine.
- [c17] 17. The process as recited in claim 16, wherein the length of the outlet path (a) extended in the longitudinal direction of the duct is at least 40% of the path of the incoming air.
- [c18] 18. The process as recited in claim 16, wherein the length of the outlet path (a) extended in the longitudinal direction of the duct is at least 60% of the path of the in-

coming air.

- [c19] 19. The process as recited in claim 16, wherein the length of the outlet path (a) extended in the longitudinal direction of the duct is at least 80% of the path of the incoming air.
- [c20] 20. The process as recited in claim 16, wherein the length of the outlet path (a) extended in the longitudinal direction of the duct is approximately 100% of the path of the incoming air.
- [c21] 21. The process as claimed in claim 16, wherein the length of the outlet path (a) extended in the longitudinal direction of the duct is approximately as long as the path the incoming air will be displaced along in the duct (2) during the period between two successive exhaust-gas pulses in the flow of said recirculated exhaust gases.
- [c22] 22. The process as claimed in claim 21, wherein the supply of the exhaust gases to the duct (2) is also distributed along a circumference running transversely to the motional direction of incoming air.
- [c23] 23. The process as claimed in claim 22, wherein the supplied exhaust gases are re-mixed in the duct (2) with the aid of at least one turbulator device.

[c24] 24. The process as claimed in claim 22, wherein the supplied exhaust gases are re-mixed in the duct (2) with the aid of at least one venturi device.